

ATTACHMENT 3

PEACH BOTTOM ATOMIC POWER STATION

UNIT 2

Docket No. 50-277

License Nos. DPR-44

TECHNICAL SPECIFICATION CHANGE REQUEST
No. 88-08

Technical Specification 3.9, Auxiliary Electrical System

"Availability and Testing of
Emergency Diesel Generators and Offsite Circuits"

LIMITING CONDITIONS FOR OPERATION

SURVEILLANCE REQUIREMENTS

3.9 AUXILIARY ELECTRICAL SYSTEM

Applicability:

Applies to the auxiliary electrical power system.

Objective:

To assure an adequate supply of electrical power for operation of those systems required for safety.

Specification:A. Auxiliary Electrical Equipment

The reactor shall not be made critical unless all of the following conditions are satisfied:

1. Two physically independent circuits between the offsite transmission network and the onsite Class 1E distribution system are operable.
2. The four diesel generators shall be operable and there shall be a minimum of 108,000 gallons of diesel fuel on site. Each operable diesel generator shall have:
 - a. A separate day tank containing a minimum of 200 gallons of fuel,
 - b. A separate fuel storage tank with a minimum of 28,000 gallons of fuel, and
 - c. A separate fuel transfer pump.
3. The unit 4kV emergency buses and the 480V emergency load centers are energized.
4. The four unit 125V batteries and their chargers shall be operable.

4.9 AUXILIARY ELECTRICAL SYSTEM

Applicability

Applies to the periodic testing requirements of the auxiliary electrical systems.

Objective:

Verify the operability of the auxiliary electrical system.

Specification:A. Auxiliary Electrical Equipment

1. Diesel Generators and Offsite Circuits

1. Each of the required independent circuits between the offsite transmission network and the onsite Class 1E distribution system shall be:
 - a. Verified OPERABLE at least once per 7 days by verifying correct breaker alignments and indicated power availability.
 - b. Demonstrated OPERABLE at least once per 18 months by transferring, manually and automatically, the start-up source from the normal circuit to the alternate circuit.

4.9.A.1 (Continued)

2. Each of the required diesel generators shall be demonstrated OPERABLE:
 - a. In accordance with the frequency specified in 4.9.A.1.2.k by:
 1. Verifying the fuel level in the fuel storage tank, and the volume of fuel onsite.
 2. Verifying the fuel transfer pump starts and transfers fuel from the storage system to the day fuel tank.
 3. Verifying that the diesel can start^a and gradually accelerate to synchronous speed with generator voltage and frequency at 4160 ± 410 volts and 60 ± 1.2 HZ.
 4. Verifying that the diesel can be synchronized, gradually loaded^a to an indicated 2400-2600^b kw and can operate with this load for at least 60 minutes.
 5. Verifying the diesel generator is aligned to provide standby power to the associated emergency busses.

^aThis test shall be conducted in accordance with the manufacturer's recommendations regarding engine pre-lube and warmup and, as applicable, loading and shutdown.

^bThis load band is meant as guidance to avoid routine overloading of the engine. Loads in excess of this band for special testing, under direct monitoring by the manufacturer or system engineer, or momentary variations due to changing bus loads shall not invalidate the test.

SURVEILLANCE REQUIREMENTS

4.9.A.1.2 (Continued)

6. Verifying the pressure in all diesel generator air start receivers to be greater than or equal to 225 psig.
- b. At least once per 184 days the diesel generator shall be started^a and verified to accelerate to synchronous speed in less than or equal to 10 seconds. The generator voltage and frequency shall reach 4160 ± 410 volts and 60 ± 1.2 Hz within 10 seconds after the start signal. The generator shall be manually synchronized to its appropriate emergency bus, loaded to an indicated 2400-2600 kw^b in less than or equal to 60 seconds, and operated for at least 60 minutes. This test, if it is performed so it coincides with the testing required by Surveillance Requirement 4.9.A.1.2.a.3 and 4.9.A.1.2.a.4, may also serve to concurrently meet those requirements as well.

^aThis test shall be conducted in accordance with the manufacturer's recommendations regarding engine prelube and warmup and, as applicable, loading and shutdown.

^bThis band is meant as guidance to avoid routine overloading of the engine. Loads in excess of this band for special testing, under direct monitoring by the manufacturer or system engineer, or momentary variations due to changing bus loads shall not invalidate the test.

LIMITING CONDITIONS FOR OPERATION

PBAPS

SURVEILLANCE REQUIREMENTS

4.9.A.1.2 (Continued)

c. By removing accumulated water:

1. From the day tank at least once per 31 days and after each occasion when the diesel is operated for greater than 1 hour, and
2. From the storage tank at least once per 31 days.

d. By sampling new fuel oil in accordance with ASTM D4057-81 prior to addition to the storage tanks and:

1. By verifying in accordance with the tests specified in ASTM D975-81 prior to addition to the storage tanks that the sample has:

- a) An API Gravity of within 0.3 degrees at 60 degrees F or a specific gravity of within 0.0016 at 60/60 degrees F when compared to the supplier's certificate; or an absolute specific gravity at 60/60 degrees F of greater than or equal to 0.83 but less than or equal to 0.89; or an API Gravity at 60 degrees F greater than or equal to 27 degrees but less than or equal to 39 degrees.

LIMITING CONDITIONS FOR OPERATION

PBAPS

SURVEILLANCE REQUIREMENTS

4.9.A.1.2.d.1 (Continued)

- b) A kinematic viscosity at 40 degrees C of greater than or equal to 1.9 centistokes but less than or equal to 4.1 centistokes, if gravity was not determined by comparison with the supplier's certification.
 - c) A flash point equal to or greater than 125 degrees F, and
 - d) A clear and bright appearance with proper color when tested in accordance with ASTM D4176-82.
2. By verifying within 31 days of obtaining the sample that the other properties specified in Table 1 of ASTM D975-81 are met when tested in accordance with ASTM D975-81 except that the analysis for sulfur may be performed in accordance with ASTM D1552-79 or ASTM D2622-82.

4.9.A.1.2 (Continued)

- e. At least once every 31 days by obtaining a sample of fuel oil from the storage tank in accordance with ASTM D2276-78, and verifying that total particulate contamination is less than 10mg/liter when checked in accordance with ASTM D2276-78, Method A, except that the filters specified in ASTM D2276-78, Sections 5.1.6 and 5.1.7, may have a nominal pore size of up to three (3) microns.
- f. At least once per 18 months by:
 - 1. Subjecting the diesel to an inspection in accordance with procedures prepared in conjunction with its manufacturer's recommendations for this class of standby service.
 - 2. Verifying the diesel generator capability to reject a load of greater than or equal to that of the RHR Pump Motor for each diesel generator while maintaining voltage within $\pm 10\%$ of the initial value and frequency at $60 \pm 1.2\text{hz}$.
 - 3. Verifying the diesel generator capability to reject a load of 2600 kW without tripping. The generator voltage shall not exceed $\pm 15\%$ of the initial value during and following the load rejection.

4.9.A.1.2.f (Continued)

4. Verifying that all automatic diesel generator trips except engine overspeed, generator differential over-current, generator ground overcurrent and manual cardox initiation are automatically bypassed upon an ECCS actuation signal.
5. Verifying the diesel generator operates^a for at least 24 hours. During the first 2 hours of this test, the diesel generator shall be loaded to an indicated 2800-3000 kW^b and during the remaining 22 hours of this test, the diesel generator shall be loaded to an indicated 2400-2600 kW^b.
6. Verifying diesel generator capability at full load temperature within 5 minutes after completing the 24 hour test^c by starting and loading the diesel as described in Surveillance Requirement 4.9.A.1.2.b and operating for greater than 5 minutes^d.

^aThis test shall be conducted in accordance with the manufacturer's recommendations regarding engine prelube and warm-up and, as applicable, loading and shutdown.

^bThis band is meant as guidance to avoid routine overloading of the engine. Loads in excess of this band for special testing, under direct monitoring by the manufacturer or system engineer, or momentary variations due to changing bus loads shall not invalidate the test.

^cIf Surveillance Requirement 4.9.A.1.2.f.6 is not satisfactorily completed, it is not necessary to repeat the preceding 24-hour test. Instead, the diesel generator may be operated at 2400-2600 kW for 1 hour or until operating temperature has stabilized prior to performing Surveillance Requirement 4.9.A.1.2.f.6.

^dPerformance of Surveillance Requirement 4.9.A.1.2.f.6 will not be used to satisfy the requirements of Surveillance Requirement 4.9.A.1.2.b.

4.9.A.1.2 (Continued)

7. Verifying that the fuel transfer pump transfers fuel from each fuel storage tank to the day tank of each diesel via the installed cross connection lines.

g. At least once each operating year by:

1. Simulating a loss-of-offsite power to itself, and:

a) Verifying deenergization of the emergency busses and load shedding from the emergency busses.

b) Verifying the diesel generator starts^a on the auto-start signal, energizes the emergency busses within 10 seconds, energizes the permanent and auto-connected loads through the individual load timers and operates for greater than or equal to 5 minutes.

After energization, the steady-state voltage and frequency of the emergency busses shall be maintained at 4160 ± 410 volts and 60 ± 1.2 Hz during this test.

^aThis test shall be conducted in accordance with the manufacturer's recommendations regarding engine prelube and warm-up and, as applicable, loading and shutdown.

4.9.A.1.2 (Continued)

2. Verifying that on an ECCS actuation test signal, without loss-of-offsite power, the diesel generator starts^a on the auto-start signal and operates for greater than or equal 5 minutes. The generator voltage and frequency shall reach 4160 ± 410 volts and 60 ± 1.2 Hz within 10 seconds after the auto-start signal; the steady state generator voltage and frequency shall be maintained within these limits during this test.
3. Simulating a loss-of-offsite power in conjunction with an ECCS actuation test signal, and:
 - a) Verifying deenergization of the emergency busses and load shedding from the emergency busses.
 - b) Verifying the diesel generator starts^a on the auto-start signal, energizes the emergency busses within 10 seconds, energizes the permanent and auto-connected loads through the individual load timers and operates for greater than or equal to 5 minutes.

After energization, the steady-state voltage and frequency of the emergency busses shall be maintained at 4160 ± 410 volts and 60 ± 1.2 Hz during this test.

^aThis test shall be conducted in accordance with the manufacturer's recommendations regarding engine prelube and warmup and, as applicable, loading and shutdown.

4.9.A.1.2 (Continued)

4. Verifying the diesel generator's capability to:
 - a) Synchronize with the offsite power source while the generator is loaded with its emergency loads upon a simulated restoration of offsite power.
 - b) Transfer its loads to the offsite power source, and
 - c) Be restored to its standby status.
- h. At least once per 10 years or after any modifications which could affect diesel generator interdependence by starting^a all four diesel generators simultaneously and verifying that all four diesel generators accelerate to at least 855 rpm in less than or equal to 10 seconds.
- i. At least once per 10 years by draining each fuel oil tank, removing the accumulated sediment and cleaning the tank using a sodium hypochlorite or equivalent solution.
- j. The fuel oil storage tank cathodic protection system shall be checked as follows:
 1. At least once every twelve months perform a test to determine whether the cathodic protection is adequate, and

^aThis test shall be conducted in accordance with the manufacturer's recommendations regarding engine prelube and warmup and, as applicable, loading and shutdown.

LIMITING CONDITIONS FOR OPERATION

PBAPS

SURVEILLANCE REQUIREMENTS

4.9.A.1.2 (Continued)

2. At least once every two months inspect the cathodic protection rectifiers.

- k. If the number of failures during the last 20 valid demands^d is less than or equal to 1, the test frequency shall be at least once per 31 days.

If the number of failures during the last 20 valid demands is greater than or equal to 2, the test frequency shall be at least once per 7 days^e.

1. All diesel generator failures, valid or non-valid, shall be reported to the Commission in a Special Report within 30 days. Reports of the diesel generator failures shall include the information recommended in Regulatory Position C.3.b of Regulatory Guide 1.108, Revision 1, August 1977.

^dCriteria for determining the number of failures and number of valid demands shall be in accordance with Regulatory Position C.2.e of Regulatory Guide 1.108, but determined on a per diesel generator basis.

^eThe associated test frequency shall be maintained until seven consecutive failure free demands have been performed and the number of failures in the last 20 demands have been reduced to one. For the purposes of determining the required frequency, the previous test failure count may be reduced to zero if a complete diesel overhaul to like-new condition is completed. This diesel overhaul, including appropriate post-maintenance operation and testing, shall be specifically approved by the manufacturer and acceptable diesel reliability must be demonstrated. The reliability criterion shall be the successful completion of 14 consecutive tests. Ten of these tests may be slow starts in accordance with Surveillance Requirements 4.9.A.1.2.a.3 and 4.9.A.1.2.a.4 and four tests shall be fast starts in accordance with the Surveillance Requirement 4.9.A.1.2.b. If this criterion is not satisfied during the first series of tests, any alternate criterion to be used to reset the valid failure count to zero requires NRC approval.

4.9.A.2 Unit Batteries

- a. Every week the specific gravity, the voltage and temperature of the pilot cell and overall battery voltage shall be measured and logged.
- b. Every three months the measurements shall be made of voltage of each cell to nearest 0.1 Volt, specific gravity of each cell, and temperature of every fifth cell. These measurements shall be logged.
- c. The station batteries shall be subjected to a performance test every third refueling outage and a service test during the other refueling outage. In lieu of the performance test every third refueling outage, any battery that shows "signs of degradation or has reached 85% of its service life" shall be subjected to an annual performance test. The service test need not be performed on the refueling outage during which the performance test was conducted. The specific gravity and voltage of each cell shall be determined after the discharge and logged.

4.9.A.3 Swing Buses

- a. Every two months the swing buses supplying power to the Low Pressure Coolant Injection System (LPCIS) valves shall be tested to assure that the transfer circuits operate as designed.

LIMITING CONDITIONS FOR OPERATION

SURVEILLANCE REQUIREMENTS

3.9.B Operation with Inoperable Equipment

Whenever the reactor is in Run Mode or Startup Mode with the reactor not in a Cold Condition, the availability of electric power shall be as specified in 3.9.A, except as follows:

1. With one offsite circuit required by Specification 3.9.A.1 inoperable, restore at least two offsite circuits to OPERABLE status within 7 days or be in least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.
2. With two independent off-site circuits required by Specification 3.9.A.1 inoperable, continued operation is permissible, provided the four diesel generators and associated emergency busses are operable, all core and containment cooling systems are operable and reactor power level is reduced to 25% of the design.

4.9.B. Operation with Inoperable Equipment

1. When it is determined that one offsite circuit required by Specification 3.9.A.1 is inoperable, verify the OPERABILITY of the remaining A.C. sources by performing Surveillance Requirement 4.9.A.1.1.a within 1 hour and once per 8 hours thereafter.

If any of the diesel generators have not been successfully tested within the preceding 24 hours, demonstrate OPERABILITY of these diesel generators by performing Surveillance Requirement 4.9.A.1.2.a.3 for one diesel at a time within 24 hours and once per 72 hours thereafter.

2. None

PBAPS

LIMITING CONDITIONS FOR OPERATION

SURVEILLANCE REQUIREMENTS

3.9.8 (Continued)

3. With one diesel generator inoperable, restore the inoperable diesel generator and associated emergency bus to OPERABLE status within 7 days or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

3. When it is determined that one diesel generator is inoperable, verify the OPERABILITY of the remaining A.C. sources by performing Surveillance Requirement 4.9.A.1.1.a within 1 hour and once per 8 hours thereafter. Verify within 2 hours that required systems, subsystems, trains, components, and devices that depend on the remaining diesel generators as a source of emergency power are OPERABLE.

If the diesel generator became inoperable for any reason other than preplanned preventative maintenance, or testing, demonstrate the OPERABILITY of the remaining operable diesel generators by performing Surveillance Requirement 4.9A.1.2.a.3 for one diesel at a time, within 24 hours* and at least once per 72 hours thereafter.

*This test is required to be completed regardless of when the inoperable diesel generator is restored to OPERABILITY for failures that are potentially generic to the remaining diesel generators and for which appropriate alternative testing cannot be designed.

PBAPS

LIMITING CONDITIONS FOR OPERATION

SURVEILLANCE REQUIREMENTS

3.9.B (Continued)

4. With one diesel generator and one offsite circuit required by Specification 3.9.A.1 inoperable, restore at least two offsite circuits or four diesel generators to OPERABLE status within 72 hours from the time of initial loss or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

4. When it is determined that one diesel generator and one offsite circuit required by Specification 3.9.A.1 are inoperable, verify the OPERABILITY of the remaining A.C. sources by performing Surveillance Requirement 4.9.A.1.1.a within 1 hour and once per 8 hours thereafter. Verify within 2 hours, that required systems, subsystems, trains, components, and devices that depend on the remaining diesel generators as a source of emergency power are OPERABLE.

If the diesel generator became inoperable for any reason other than preplanned preventative maintenance, or testing, demonstrate the OPERABILITY of the remaining diesel generators by performing Surveillance Requirement 4.9.A.1.2.a.3 for one diesel generator at a time, within 8 hours*.

5. From and after the date that one of the 125 volt battery systems is made or found to be inoperable for any reason, continued reactor operation is permissible during the succeeding three days within electrical safety considerations, provided repair work is initiated in the most expeditious manner to return the failed component to an operable state, and Specifications 3.5.F and 3.9.B.3 are satisfied.

5. None

*This test is required to be completed regardless of when the inoperable diesel generator is restored to OPERABILITY for failures that are potential¹ generic to the remaining diesel generators and for which appropriate alternative testing cannot be designed.

LIMITING CONDITIONS FOR OPERATION

PBAPS

SURVEILLANCE REQUIREMENTS

3.9.8 (Continued)

- | | | |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| 6. | With fuel oil in one of the diesel generator main storage tanks not available or not in conformance with Surveillance Requirement 4.9.A.1.2.e, implement the following: | 6. None |
| a. Isolate the main storage tank from the system, with the associated diesel generator being supplied from one of the remaining storage tanks within 8 hours, and | | |
| b. Establish and maintain a minimum of 108,000 gallons of diesel fuel oil in the other three main storage tanks within 72 hours, and | | |
| c. Sample the fuel oil in the other three main storage tanks and confirm conformance with specification 4.9.A.1.e within 24 hours, and | | |
| d. Replace the unacceptable fuel oil with acceptable fuel and return the storage tank to service within 7 days, or place the reactor in Cold Shutdown within 24 hours. | | |

Accelerated testing of the diesel generators is not required.

- | | | |
|----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| 7. | With one of the 4kV emergency busses or 480V emergency load centers required by 3.9.A.3 not energized, declare the associated equipment inoperable and take the appropriate action for that system. | 7. None |
|----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|

Reenergize the bus within 24 hours or be in COLD SHUTDOWN within the following 24 hours.

PBAPS

3.9 BASES

The general objective of this Specification is to assure an adequate source of electrical power to operate the auxiliaries during plant operation, to operate facilities to cool and lubricate the plant during shutdown, and to operate the engineered safeguards following the accident. Two independent power sources from the off-site transmission network and the diesel generators are available. One off-site source is provided through the 13.2 kV startup regulating transformer switchgear No. 3 supplied from either the No. 343 startup transformer or the startup and emergency auxiliary regulating transformer No. 3. The other off-site source is provided through the 13.2 kV startup transformer switchgear No. 2 supplied from the startup and emergency auxiliary transformer No. 2. The two off-site sources are connected to the on-site Class 1E distribution system (which begins with the 4kV emergency buses) by physically independent circuits. The dc supply is required for switchgear and engineered safety feature systems. Specification 3.9.A states the required availability of ac and dc power; i.e., active off-site ac sources and the required amount of on-site ac and dc sources. The requirement for a minimum onsite inventory of diesel fuel is based upon an analysis of the time dependent electrical loads on the diesels following an accident. A battery charger is supplied with each of the 125-Volt batteries.

The No. 2, No. 3 and No. 343 startup transformers and unit auxiliary transformers are each sized to carry 100% of the auxiliary load. If one of the off-site power circuits becomes inoperable, the unit can continue to operate since the unit auxiliary transformer is in service, the other off-site power circuit is available, and the required number of diesel generators is operational.

If both off-site power circuits are inoperable, the reactor power level must be reduced to a value whereby the units can safely reject the load and continue to supply auxiliary electric power to the station.

In the normal mode of operation, the No. 2 startup transformer and either the No. 3 or No. 343 startup transformer are energized and four diesel generators are operable. One diesel generator may be allowed out-of-service based on the availability of power from the startup transformer and the fact that three diesel generators carry sufficient engineered safeguards equipment to cover all breaks. With one off-site power circuit and one diesel generator out-of-service, the off-site transmission line corresponding to the operable off-site power circuit must be available. Upon the loss of one on-site and one off-site power source, power would be available from the other immediate off-site power source and the three operable on-site diesels to carry sufficient engineered safeguards equipment to cover all breaks. In addition to these two power sources, removal of the Isolated Phase Bus "quick" disconnect links would allow backfeed of power through the main transformer to the unit auxiliary transformer and provide power to carry the full station auxiliary load. The time required to perform this operation is comparable to the time the reactor could remain on RCIC operation before controlled depressurization need be initiated.

3.9 BASES (Cont'd.)

The 125-Volt battery system shall have a minimum of 105 Volts at the battery terminals to be considered operable. The 250-Volt portion of the 125/250-Volt battery system shall have a minimum of 210 Volts at the battery terminals to be considered operable.

The ACTION requirements specified for the degradation of the power sources provide restrictions upon continued facility operation commensurate with the level of degradation. The OPERABILITY of the power sources are consistent with the initial condition assumptions of the safety analyses.

When a diesel generator is inoperable, there is an ACTION requirement to verify that all required systems, subsystems, trains, components and devices, that depend on the remaining OPERABLE diesel generators as a source of emergency power, are also OPERABLE. This requirement is intended to provide assurance that a loss-of-offsite power event will not result in a complete loss of safety function of critical systems during the period one of the diesel generators is inoperable. The term verify as used in this context means to administratively check by examining logs or other information to determine if certain components are out-of-service for maintenance or other reasons. It does not mean to perform the surveillance requirements needed to demonstrate the OPERABILITY of the component.

Demonstrations of diesel generator operability required by Section 4.9.B may include paralleling with the offsite source and operating the diesel generator under load.

A standby heating system is used to maintain engine jacket cooling water and engine lube oil temperature at optimum standby starting conditions. An EDG will be declared inoperable if the required temperatures cannot be maintained. The EDGs will not be operated for the sole purpose of maintaining engine temperatures.

Following an EDG failure, the redundant EDG will be inspected prior to a test start to detect any external conditions that indicate starting the EDG might cause similar degradation or damage.

The ESWS has two 100 percent cooling capacity pumps, each powered from a separate standby power supply. A third pump equivalent to the two ESW pumps, the Emergency Cooling Water pump, is located at the Emergency Cooling Tower. This latter pump requires the operability of one of the two ESW booster pumps and two of the three Emergency Cooling Tower fans to function adequately. In the event the 2 pumps are inoperable, the allowable repair period is conservative in view of the 3-month test interval for the system.

4.9 Bases

The surveillance requirements for demonstrating the OPERABILITY of the diesel generators follow the recommendations of Regulatory Guide 1.9, "Selection of Diesel Generator Set Capacity for Standby Power Supplies," March 10, 1971, Regulatory Guide 1.137 "Fuel-Oil Systems for Standby Diesel Generators," Revision 1, October 1979 and Regulatory Guide 1.108, "Periodic Testing of Diesel Generator Units Used as Onsite Electric Power Systems at Nuclear Power Plants," Revision 1, August 1977 except for paragraphs C.2.A(3), C.2.C(1), C.2.C(2), C.2.D(2), C.2.D(3) and C.2.D(4). The exceptions to Regulatory Guide 1.108 allow for gradual loading of diesel generators during testing and decreased surveillance test frequencies (in response to Generic Letter 84-15). Test procedures minimize the period of time that a diesel generator would not be capable of providing emergency power and contain direction for the prompt restoration of the diesel, if necessary, during testing.

PBAPS

4.9 BASES (cont'd)

The diesel generator voltage may decrease to 59% of nominal when the 2000 HP RHR pump motor is started. The load rejection test of the largest single load will be conducted with the EDG governor in isochronous mode using the Residual Heat Removal Pump in full flow test as the rejected load.

The term permanent and auto-connected loads means those loads which the diesel would normally be expected to supply in the scenario being tested. Verification of load shedding from the emergency busses will include only those normally powered from the emergency bus during plant operations. The loads described by the term emergency loads are a Residual Heat Removal Pump, a High Pressure Service Water Pump and the 480 Volt emergency bus load center.

The diesel fuel oil quality must be checked to ensure proper operation of the diesel generators. Water content should be minimized because water in the fuel could contribute to excessive damage to the diesel engine. Amendment No. 131 centralized commitments related to Position C.2 of Regulatory Guide 1.137, Revision 1 (October, 1979) "Fuel Oil Systems for Standby Diesel Generators".

Although station batteries will deteriorate with time, utility experience indicates there is almost no possibility of precipitous failure. The type of surveillance described in this specification is that which has been demonstrated over the years to provide an indication of a cell becoming irregular or unserviceable long before it becomes a failure. In addition, the checks described also provide adequate indication that the batteries have the specified ampere hour capability.

The station batteries shall be subjected to a performance test every third refueling outage and a service test during the other refueling outages. This testing frequency complies with the testing requirements of the Institute of Electrical and Electronics Engineers (IEEE) Standard 450 (1975), "Recommended Practice for Maintenance, Testing and Replacement of Large Lead Storage Batteries," and Regulatory Guide 1.129, Revision 1 (February 1978), "Maintenance, Testing and Replacement of Large Lead Storage Batteries for Nuclear Power Plants."

A performance test determines the ability of the battery to meet a specified discharge rate and duration based on the manufacturer's rating. A service test proves the capability of the battery to deliver the design requirements of the dc systems; i.e., supply and maintain in operable status all of the actual emergency loads for the design basis accident. A performance test is the most severe test because the cycling on the battery at manufacturer's rating shortens the service life of the battery. A service test is performed at design load instead of manufacturer's ratings.

The test interval for the Emergency Service Water System, the ESW booster pumps, Emergency Cooling Water pump, Emergency Cooling Tower fans, and pump room fans associated with the ESW pumps is deemed adequate to provide assurance that the equipment will be operable based on good engineering judgement and system redundancy, plus the additional testing accomplished when the diesel generators are tested. Pump operability tests during normal operation will be performed by measuring the shut-off head.

TABLE 3.2.B
INSTRUMENTATION THAT INITIATES OR CONTROLS THE CORE AND
CONTAINMENT COOLING SYSTEMS

Minimum No. of Operable Instrument Channels For Trip System (1)	Trip Function	Trip Level Setting	Number of Instru- ment Channels Pro- vided by Design	Remarks
2	Core Spray Pump	6 +/- sec.	4 timers	All pumps-loss of offsite power only
	Start Timer	13 sec. +/-7% of setting	2 timers	A&C pumps-offsite power available
		23 sec. +/-7% of setting	2 timers	B&D pumps-offsite power available
1 per 4kV bus (7)	480V Emergency Load Center Timer	3 +/-0.5 sec.	4 timers	All timers - loss of offsite power only
2	LPCI Pump Start Timer (Four Pumps)	2 sec. +/-7% of setting 8 sec. +/-7% of setting	4 timers 4 timers	LPCI pumps A&B LPCI pumps C&D
1	ADS Actuation Timer	90 3/t / =120 seconds	2 timers	In conjunction with Low Reactor Water Level, High Drywell Pressure and LPCI or Core Spray Pump running interlock, initiates ADS.
2	ADS Bypass Timer*	8 / =t / =10 minutes	4 timers	In conjunction with low reactor water level, bypass high drywell pressure initiation of ADS.
2	RHR (LPCI) Pump Discharge Pressure Interlock	50 +/- 10 psig	4 channels	Defers ADS actuation pending confirmation of Low Pressure Core Cooling system operation (LPCI Pump running interlock).
2	Core Spray Pump Discharge Pressure Interlock	185 +/- 10 psig	4 channels	Defers ADS actuation pending confirmation of Low Pressure Core cooling system operation (Core Spray Pump running interlock).

PBAPS

NOTES FOR TABLE 3.2.B

1. Whenever any CSCS subsystem is required by Section 3.5 to be operable, there shall be two operable trip systems. If the first column cannot be met for one of the trip systems, that trip system shall be placed in the tripped condition or the reactor shall be placed in the Cold Shutdown Condition within 24 hours.
2. Close isolation valves in RCIC subsystem.
3. Close isolation valves in HPCI subsystem.
4. Instrument set point corresponds to 378 inches above vessel zero.
5. HPCI has only one trip system for these sensors.
6. With the number of OPERABLE channels less than required by the Minimum OPERABLE Channels per Trip System requirement, place at least one inoperable channel in the tripped condition within one hour or declare the RCIC system inoperable.
7. The failure of a 480V Emergency Load Center timer could result in the failure of a 480V Emergency Load Center to re-energize following the loss of one or both offsite sources. Therefore, Technical Specification 3.9.B.7 will apply when a 480V Emergency Load Center timer is not operable.

PBAPS

LIMITING CONDITIONS FOR OPERATIONSURVEILLANCE REQUIREMENTS3.5.F Minimum Low Pressure Cooling Availability4.5.F Minimum Low Pressure Cooling Availability

1. Deleted
2. Any combination of inoperable components in the core and containment cooling systems shall not defeat the capability of the remaining operable components to fulfill the cooling functions.
3. When irradiated fuel is in the reactor vessel and the reactor is in the Cold Shutdown Condition, both core spray systems, the LPCI and containment cooling systems may be inoperable, provided no work is being done which has the potential for draining the reactor vessel.
4. During a refueling outage, fuel and LPRM removal and replacement may be performed provided at least one of the following conditions below is satisfied:
 - a. Both core spray systems and the LPCI system shall be operable except that one core spray system or the LPCI system may be inoperable for a period of thirty days, or
 - b. The reactor vessel head is removed, the cavity is flooded, the spent fuel pool gates are removed, and the water level is maintained at least 21 feet over the top of irradiated fuel assemblies seated in the spent fuel storage pool racks and no work is being performed which has the potential for draining the reactor vessel.

1. Deleted

ATTACHMENT 4

PEACH BOTTOM ATOMIC POWER STATION

UNIT 3

Docket No. 50-278

License No. DPR-56

TECHNICAL SPECIFICATION CHANGE REQUEST
No. 88-08

Technical Specification 3.9, Auxiliary Electrical System

"Availability and Testing of
Emergency Diesel Generators and Offsite Circuits"

3.9 AUXILIARY ELECTRICAL SYSTEM

Applicability:

Applies to the auxiliary electrical power system.

Objective:

To assure an adequate supply of electrical power for operation of those systems required for safety.

Specification:A. Auxiliary Electrical Equipment

The reactor shall not be made critical unless all of the following conditions are satisfied:

1. Two physically independent circuits between the offsite transmission network and the onsite Class 1E distribution system are operable.
2. The four diesel generators shall be operable and there shall be a minimum of 108,000 gallons of diesel fuel on site. Each operable diesel generator shall have:
 - a. A separate day tank containing a minimum of 200 gallons of fuel,
 - b. A separate fuel storage tank with a minimum of 28,000 gallons of fuel, and
 - c. A separate fuel transfer pump.
3. The unit 4kV emergency buses and the 480V emergency load centers are energized.
4. The four unit 125V batteries and their chargers shall be operable.

4.9 AUXILIARY ELECTRICAL SYSTEM

Applicability

Applies to the periodic testing requirements of the auxiliary electrical systems.

Objective:

Verify the operability of the auxiliary electrical system.

Specification:A. Auxiliary Electrical Equipment

1. Diesel Generators and Offsite Circuits

1. Each of the required independent circuits between the offsite transmission network and the onsite Class 1E distribution system shall be:
 - a. Verified OPERABLE at least once per 7 days by verifying correct breaker alignments and indicated power availability.
 - b. Demonstrated OPERABLE at least once per 18 months by transferring, manually and automatically, the start-up source from the normal circuit to the alternate circuit.

4.9.A.1 (Continued)

2. Each of the required diesel generators shall be demonstrated OPERABLE:
 - a. In accordance with the frequency specified in 4.9.A.1.2.k by:
 1. Verifying the fuel level in the fuel storage tank, and the volume of fuel onsite.
 2. Verifying the fuel transfer pump starts and transfers fuel from the storage system to the day fuel tank.
 3. Verifying that the diesel can start^a and gradually accelerate to synchronous speed with generator voltage and frequency at 4160 ± 410 volts and 60 ± 1.2 Hz.
 4. Verifying that the diesel can be synchronized, gradually loaded^b to an indicated 2400-2600^b kw and can operate with this load for at least 60 minutes.
 5. Verifying the diesel generator is aligned to provide standby power to the associated emergency busses.

^aThis test shall be conducted in accordance with the manufacturer's recommendations regarding engine pre-lube and warmup and, as applicable, loading and shutdown.

^bThis load band is meant as guidance to avoid routine overloading of the engine. Loads in excess of this band for special testing, under direct monitoring by the manufacturer or system engineer, or momentary variations due to changing bus loads shall not invalidate the test.

4.9.A.1.2 (Continued)

6. Verifying the pressure in all diesel generator air start receivers to be greater than or equal to 225 psig.
- b. At least once per 184 days the diesel generator shall be started^a and verified to accelerate to synchronous speed in less than or equal to 10 seconds. The generator voltage and frequency shall reach 4160 ± 410 volts and 60 ± 1.2 Hz within 10 seconds after the start signal. The generator shall be manually synchronized to its appropriate emergency bus, loaded to an indicated 2400-2600 kw^b in less than or equal to 60 seconds, and operated for at least 60 minutes. This test, if it is performed so it coincides with the testing required by Surveillance Requirement 4.9.A.1.2.a.3 and 4.9.A.1.2.a.4, may also serve to concurrently meet those requirements as well.

^aThis test shall be conducted in accordance with the manufacturer's recommendations regarding engine prelube and warmup and, as applicable, loading and shutdown.

^bThis band is meant as guidance to avoid routine overloading of the engine. Loads in excess of this band for special testing, under direct monitoring by the manufacturer or system engineer, or momentary variations due to changing bus loads shall not invalidate the test.

LIMITING CONDITIONS FOR OPERATION

PBAPS

SURVEILLANCE REQUIREMENTS

4.9.A.1.2 (Continued)

c. By removing accumulated water:

1. From the day tank at least once per 31 days and after each occasion when the diesel is operated for greater than 1 hour, and
2. From the storage tank at least once per 31 days.

d. By sampling new fuel oil in accordance with ASTM D4057-81 prior to addition to the storage tanks and:

1. By verifying in accordance with the tests specified in ASTM D975-81 prior to addition to the storage tanks that the sample has:
 - a) An API Gravity of within 0.3 degrees at 60 degrees F or a specific gravity of within 0.0016 at 60/60 degrees F when compared to the supplier's certificate; or an absolute specific gravity at 60/60 degrees F of greater than or equal to 0.83 but less than or equal to 0.89; or an API Gravity at 60 degrees F greater than or equal to 27 degrees but less than or equal to 39 degrees.

LIMITING CONDITIONS FOR OPERATION

PBAPS

SURVEILLANCE REQUIREMENTS

4.9.A.1.2.d.1 (Continued)

- b) A kinematic viscosity at 40 degrees C of greater than or equal to 1.9 centistokes but less than or equal to 4.1 centistokes, if gravity was not determined by comparison with the supplier's certification.
 - c) A flash point equal to or greater than 125 degrees F, and
 - d) A clear and bright appearance with proper color when tested in accordance with ASTM D4176-82.
2. By verifying within 31 days of obtaining the sample that the other properties specified in Table 1 of ASTM D975-81 are met when tested in accordance with ASTM D975-81 except that the analysis for sulfur may be performed in accordance with ASTM D1552-79 or ASTM D2622-82.

4.9.A.1.2 (Continued)

- e. At least once every 31 days by obtaining a sample of fuel oil from the storage tank in accordance with ASTM D2276-78, and verifying that total particulate contamination is less than 10mg/liter when checked in accordance with ASTM D2276-78, Method A, except that the filters specified in ASTM D2276-78, Sections 5.1.6 and 5.1.7, may have a nominal pore size of up to three (3) microns.
- f. At least once per 18 months by:
 - 1. Subjecting the diesel to an inspection in accordance with procedures prepared in conjunction with its manufacturer's recommendations for this class of standby service.
 - 2. Verifying the diesel generator capability to reject a load of greater than or equal to that of the RHR Pump Motor for each diesel generator while maintaining voltage within $\pm 10\%$ of the initial value and frequency at $60 \pm 1.2\text{hz}$.
 - 3. Verifying the diesel generator capability to reject a load of 2600 kW without tripping. The generator voltage shall not exceed $\pm 15\%$ of the initial value during and following the load rejection.

4.9.A.1.2.f (Continued)

4. Verifying that all automatic diesel generator trips except engine overspeed, generator differential over-current, generator ground overcurrent and manual cardox initiation are automatically bypassed upon an ECCS actuation signal.
5. Verifying the diesel generator operates^a for at least 24 hours. During the first 2 hours of this test, the diesel generator shall be loaded to an indicated 2800-3000 kW^b and during the remaining 22 hours of this test, the diesel generator shall be loaded to an indicated 2400-2600 kW^b.
6. Verifying diesel generator capability at full load temperature within 5 minutes after completing the 24 hour test^c by starting and loading the diesel as described in Surveillance Requirement 4.9.A.1.2.b and operating for greater than 5 minutes^d.

^aThis test shall be conducted in accordance with the manufacturer's recommendations regarding engine prelube and warm-up and, as applicable, loading and shutdown.

^bThis band is meant as guidance to avoid routine overloading of the engine. Loads in excess of this band for special testing, under direct monitoring by the manufacturer or system engineer, or momentary variations due to changing bus loads shall not invalidate the test.

^cIf Surveillance Requirement 4.9.A.1.2.f.6 is not satisfactorily completed, it is not necessary to repeat the preceding 24-hour test. Instead, the diesel generator may be operated at 2400-2600 kW for 1 hour or until operating temperature has stabilized prior to performing Surveillance Requirement 4.9.A.1.2.f.6.

^dPerformance of Surveillance Requirement 4.9.A.1.2.f.6 will not be used to satisfy the requirements of Surveillance Requirement 4.9.A.1.2.b.

4.9.A.1.2 (Continued)

7. Verifying that the fuel transfer pump transfers fuel from each fuel storage tank to the day tank of each diesel via the installed cross connection lines.
- g. At least once each operating cycle by:
 1. Simulating a loss-of-offsite power by itself, and:
 - a) Verifying deenergization of the emergency busses and load shedding from the emergency busses.
 - b) Verifying the diesel generator starts^a on the auto-start signal, energizes the emergency busses within 10 seconds, energizes the permanent and auto-connected loads through the individual load timers and operates for greater than or equal to 5 minutes.

After energization, the steady-state voltage and frequency of the emergency busses shall be maintained at 4160 ± 410 volts and 60 ± 1.2 Hz during this test.

^aThis test shall be conducted in accordance with the manufacturer's recommendations regarding engine prelube and warm-up and, as applicable, loading and shutdown.

4.9.A.1.2 (Continued)

2. Verifying that on an ECCS actuation test signal, without loss-of-offsite power, the diesel generator starts^a on the auto-start signal and operates for greater than or equal 5 minutes. The generator voltage and frequency shall reach 4160 ± 410 volts and 60 ± 1.2 Hz within 10 seconds after the auto-start signal; the steady state generator voltage and frequency shall be maintained within these limits during this test.
3. Simulating a loss-of-offsite power in conjunction with an ECCS actuation test signal, and:
 - a) Verifying deenergization of the emergency busses and load shedding from the emergency busses.
 - b) Verifying the diesel generator starts^a on the auto-start signal, energizes the emergency busses within 10 seconds, energizes the permanent and auto-connected loads through the individual load timers and operates for greater than or equal to 5 minutes.

After energization, the steady-state voltage and frequency of the emergency busses shall be maintained at 4160 ± 410 volts and 60 ± 1.2 Hz during this test.

^aThis test shall be conducted in accordance with the manufacturer's recommendations regarding engine prelube and warmup and, as applicable, loading and shutdown.

SURVEILLANCE REQUIREMENTS

4.9.A.1.2 (Continued)

4. Verifying the diesel generator's capability to:
 - a) Synchronize with the offsite power source while the generator is loaded with its emergency loads upon a simulated restoration of offsite power.
 - b) Transfer its loads to the offsite power source, and
 - c) Be restored to its standby status.
- h. At least once per 10 years or after any modifications which could affect diesel generator interdependence by starting^a all four diesel generators simultaneously and verifying that all four diesel generators accelerate to at least 855 rpm in less than or equal to 10 seconds.
- i. At least once per 10 years by draining each fuel oil tank, removing the accumulated sediment and cleaning the tank using a sodium hypochlorite or equivalent solution.
- j. The fuel oil storage tank cathodic protection system shall be checked as follows:
 1. At least once every twelve months perform a test to determine whether the cathodic protection is adequate, and

^aThis test shall be conducted in accordance with the manufacturer's recommendations regarding engine prelube and warmup and, as applicable, loading and shutdown.

4.9.A.1.2 (Continued)

2. At least once every two months inspect the cathodic protection rectifiers.
- k. If the number of failures during the last 20 valid demands^d is less than or equal to 1, the test frequency shall be at least once per 31 days.

If the number of failures during the last 20 valid demands is greater than or equal to 2, the test frequency shall be at least once per 7 days^e.
- l. All diesel generator failures, valid or non-valid, shall be reported to the Commission in a Special Report within 30 days. Reports of the diesel generator failures shall include the information recommended in Regulatory Position C.3.b of Regulatory Guide 1.108, Revision 1, August 1977.

^dCriteria for determining the number of failures and number of valid demands shall be in accordance with Regulatory Position C.2.e of Regulatory Guide 1.108, but determined on a per diesel generator basis.

^eThe associated test frequency shall be maintained until seven consecutive failure free demands have been performed and the number of failures in the last 20 demands have been reduced to one. For the purposes of determining the required frequency, the previous test failure count may be reduced to zero if a complete diesel overhaul to like-new condition is completed. This diesel overhaul, including appropriate post-maintenance operation and testing, shall be specifically approved by the manufacturer and acceptable diesel reliability must be demonstrated. The reliability criterion shall be the successful completion of 14 consecutive tests. Ten of these tests may be slow starts in accordance with Surveillance Requirements 4.9.A.1.2.a.3 and 4.9.A.1.2.a.4 and four tests shall be fast starts in accordance with the Surveillance Requirement 4.9.A.1.2.b. If this criterion is not satisfied during the first series of tests, any alternate criterion to be used to reset the valid failure count to zero requires NRC approval.

4.9.A.2 Unit Batteries

- a. Every week the specific gravity, the voltage and temperature of the pilot cell and overall battery voltage shall be measured and logged.
- b. Every three months the measurements shall be made of voltage of each cell to nearest 0.1 Volt, specific gravity of each cell, and temperature of every fifth cell. These measurements shall be logged.
- c. The station batteries shall be subjected to a performance test every third refueling outage and a service test during the other refueling outage. In lieu of the performance test every third refueling outage, any battery that shows "signs of degradation or has reached 85% of its service life" shall be subjected to an annual performance test. The service test need not be performed on the refueling outage during which the performance test was conducted. The specific gravity and voltage of each cell shall be determined after the discharge and logged.

4.9.A.3 Swing Buses

- a. Every two months the swing buses supplying power to the Low Pressure Coolant Injection System (LPCIS) valves shall be tested to assure that the transfer circuits operate as designed.

LIMITING CONDITIONS FOR OPERATION

SURVEILLANCE REQUIREMENTS

3.9.B Operation with Inoperable Equipment

Whenever the reactor is in Run Mode or Startup Mode with the reactor not in a Cold Condition, the availability of electric power shall be as specified in 3.9.A, except as follows:

1. With one offsite circuit required by Specification 3.9.A.1 inoperable, restore at least two offsite circuits to OPERABLE status within 7 days or be in least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.
2. With two independent off-site circuits required by Specification 3.9.A.1 inoperable, continued operation is permissible, provided the four diesel generators and associated emergency busses are operable, all core and containment cooling systems are operable and reactor power level is reduced to 25% of the design.

4.9.B. Operation with Inoperable Equipment

1. When it is determined that one offsite circuit required by Specification 3.9.A.1 is inoperable, verify the OPERABILITY of the remaining A.C. sources by performing Surveillance Requirement 4.9.A.1.1.a within 1 hour and once per 8 hours thereafter.

If any of the diesel generators have not been successfully tested within the preceding 24 hours, demonstrate OPERABILITY of these diesel generators by performing Surveillance Requirement 4.9.A.1.2.a.3 for one diesel at a time within 24 hours and once per 72 hours thereafter.

2. None

LIMITING CONDITIONS FOR OPERATION

PBAPS

SURVEILLANCE REQUIREMENTS

3.9.B (Continued)

3. With one diesel generator inoperable, restore the inoperable diesel generator and associated emergency bus to OPERABLE status within 7 days or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

3. When it is determined that one diesel generator is inoperable, verify the OPERABILITY of the remaining A.C. sources by performing Surveillance Requirement 4.9.A.1.1.a within 1 hour and once per 8 hours thereafter. Verify within 2 hours that required systems, subsystems, trains, components, and devices that depend on the remaining diesel generators as a source of emergency power are OPERABLE.

If the diesel generator became inoperable for any reason other than preplanned preventative maintenance, or testing, demonstrate the OPERABILITY of the remaining operable diesel generators by performing Surveillance Requirement 4.9A.1.2.a.3 for one diesel at a time, within 24 hours* and at least once per 72 hours thereafter.

*This test is required to be completed regardless of when the inoperable diesel generator is restored to OPERABILITY for failures that are potentially generic to the remaining diesel generators and for which appropriate alternative testing cannot be designed.

LIMITING CONDITIONS FOR OPERATION

SURVEILLANCE REQUIREMENTS

3.9.B (Continued)

4. With one diesel generator and one offsite circuit required by Specification 3.9.A.1 inoperable, restore at least two offsite circuits or four diesel generators to OPERABLE status within 72 hours from the time of initial loss or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

4. When it is determined that one diesel generator and one offsite circuit required by Specification 3.9.A.1 are inoperable, verify the OPERABILITY of the remaining A.C. sources by performing Surveillance Requirement 4.9.A.1.1.a within 1 hour and once per 8 hours thereafter. Verify within 2 hours, that required systems, subsystems, trains, components, and devices that depend on the remaining diesel generators as a source of emergency power are OPERABLE.

If the diesel generator became inoperable for any reason other than preplanned preventative maintenance, or testing, demonstrate the OPERABILITY of the remaining diesel generators by performing Surveillance Requirement 4.9.A.1.2.a.3 for one diesel generator at a time, within 8 hours*.

5. From and after the date that one of the 125 volt battery systems is made or found to be inoperable for any reason, continued reactor operation is permissible during the succeeding three days within electrical safety considerations, provided repair work is initiated in the most expeditious manner to return the failed component to an operable state, and Specifications 3.5.F and 3.9.B.3 are satisfied.

5. None

*This test is required to be completed regardless of when the inoperable diesel generator is restored to OPERABILITY for failures that are potentially generic to the remaining diesel generators and for which appropriate alternative testing cannot be designed.

PBAPS

LIMITING CONDITIONS FOR OPERATION

SURVEILLANCE REQUIREMENTS

3.9.B (Continued)

6. With fuel oil in one of the diesel generator main storage tanks not available or not in conformance with Surveillance Requirement 4.9.A.1.2.e, implement the following:
- a. Isolate the main storage tank from the system, with the associated diesel generator being supplied from one of the remaining storage tanks within 8 hours, and
 - b. Establish and maintain a minimum of 108,000 gallons of diesel fuel oil in the other three main storage tanks within 72 hours, and
 - c. Sample the fuel oil in the other three main storage tanks and confirm conformance with specification 4.9.A.1.e within 24 hours, and
 - d. Replace the unacceptable fuel oil with acceptable fuel and return the storage tank to service within 7 days, or place the reactor in Cold Shutdown within 24 hours.

Accelerated testing of the diesel generators is not required.

7. With one of the 4kV emergency busses or 480V emergency load centers required by 3.9.A.3 not energized, declare the associated equipment inoperable and take the appropriate action for that system.

Reenergize the bus within 24 hours or be in COLD SHUTDOWN within the following 24 hours.

6. None

7. None

PBAPS

3.9 BASES

The general objective of this Specification is to assure an adequate source of electrical power to operate the auxiliaries during plant operation, to operate facilities to cool and lubricate the plant during shutdown, and to operate the engineered safeguards following the accident. Two independent power sources from the off-site transmission network and the diesel generators are available. One off-site source is provided through the 13.2 kV startup regulating transformer switchgear No. 3 supplied from either the No. 343 startup transformer or the startup and emergency auxiliary regulating transformer No. 3. The other off-site source is provided through the 13.2 kV startup transformer switchgear No. 2 supplied from the startup and emergency auxiliary transformer No. 2. The two off-site sources are connected to the on-site Class 1E distribution system (which begins with the 4kV emergency buses) by physically independent circuits. The dc supply is required for switchgear and engineered safety feature systems. Specification 3.9.A states the required availability of ac and dc power; i.e., active off-site ac sources and the required amount of on-site ac and dc sources. The requirement for a minimum onsite inventory of diesel fuel is based upon an analysis of the time dependent electrical loads on the diesels following an accident. A battery charger is supplied with each of the 125-Volt batteries.

The No. 2, No. 3 and No. 343 startup transformers and unit auxiliary transformers are each sized to carry 100% of the auxiliary load. If one of the off-site power circuits becomes inoperable, the unit can continue to operate since the unit auxiliary transformer is in service, the other off-site power circuit is available, and the required number of diesel generators is operational.

If both off-site power circuits are inoperable, the reactor power level must be reduced to a value whereby the units can safely reject the load and continue to supply auxiliary electric power to the station.

In the normal mode of operation, the No. 2 startup transformer and either the No. 3 or No. 343 startup transformer are energized and four diesel generators are operable. One diesel generator may be allowed out-of-service based on the availability of power from the startup transformer and the fact that three diesel generators carry sufficient engineered safeguards equipment to cover all breaks. With one off-site power circuit and one diesel generator out-of-service, the off-site transmission line corresponding to the operable off-site power circuit must be available. Upon the loss of one on-site and one off-site power source, power would be available from the other immediate off-site power source and the three operable on-site diesels to carry sufficient engineered safeguards equipment to cover all breaks. In addition to these two power sources, removal of the Isolated Phase Bus "quick" disconnect links would allow backfeed of power through the main transformer to the unit auxiliary transformer and provide power to carry the full station auxiliary load. The time required to perform this operation is comparable to the time the reactor could remain on RCIC operation before controlled depressurization need be initiated.

3.9 BASES (Cont'd.)

The 125-Volt battery system shall have a minimum of 105 Volts at the battery terminals to be considered operable. The 250-Volt portion of the 125/250-Volt battery system shall have a minimum of 210 Volts at the battery terminals to be considered operable.

The ACTION requirements specified for the degradation of the power sources provide restrictions upon continued facility operation commensurate with the level of degradation. The OPERABILITY of the power sources are consistent with the initial condition assumptions of the safety analyses.

When a diesel generator is inoperable, there is an ACTION requirement to verify that all required systems, subsystems, trains, components and devices, that depend on the remaining OPERABLE diesel generators as a source of emergency power, are also OPERABLE. This requirement is intended to provide assurance that a loss-of-offsite power event will not result in a complete loss of safety function of critical systems during the period one of the diesel generators is inoperable. The term verify as used in this context means to administratively check by examining logs or other information to determine if certain components are out-of-service for maintenance or other reasons. It does not mean to perform the surveillance requirements needed to demonstrate the OPERABILITY of the component.

Demonstrations of diesel generator operability required by Section 4.9.B may include paralleling with the offsite source and operating the diesel generator under load.

A standby heating system is used to maintain engine jacket cooling water and engine lube oil temperature at optimum standby starting conditions. An EDG will be declared inoperable if the required temperatures cannot be maintained. The EDGs will not be operated for the sole purpose of maintaining engine temperatures.

Following an EDG failure, the redundant EDG will be inspected prior to a test start to detect any external conditions that indicate starting the EDG might cause similar degradation or damage.

The ESWS has two 100 percent cooling capacity pumps, each powered from a separate standby power supply. A third pump equivalent to the two ESW pumps, the Emergency Cooling Water pump, is located at the Emergency Cooling Tower. This latter pump requires the operability of one of the two ESW booster pumps and two of the three Emergency Cooling Tower fans to function adequately. In the event the 2 pumps are inoperable, the allowable repair period is conservative in view of the 3-month test interval for the system.

4.9 Bases

The surveillance requirements for demonstrating the OPERABILITY of the diesel generators follow the recommendations of Regulatory Guide 1.9, "Selection of Diesel Generator Set Capacity for Standby Power Supplies," March 10, 1971, Regulatory Guide 1.137 "Fuel-Oil Systems for Standby Diesel Generators," Revision 1, October 1979 and Regulatory Guide 1.108, "Periodic Testing of Diesel Generator Units Used as Onsite Electric Power Systems at Nuclear Power Plants," Revision 1, August 1977 except for paragraphs C.2.A(3), C.2.C(1), C.2.C(2), C.2.D(2), C.2.D(3) and C.2.D(4). The exceptions to Regulatory Guide 1.108 allow for gradual loading of diesel generators during testing and decreased surveillance test frequencies (in response to Generic Letter 84-15). Test procedures minimize the period of time that a diesel generator would not be capable of providing emergency power and contain direction for the prompt restoration of the diesel, if necessary, during testing.

PBAPS

4.9 BASES (cont'd)

The diesel generator voltage may decrease to 59% of nominal when the 2000 HP RHR pump motor is started. The load rejection test of the largest single load will be conducted with the EDG governor in isochronous mode using the Residual Heat Removal Pump in full flow test as the rejected load.

The term permanent and auto-connected loads means those loads which the diesel would normally be expected to supply in the scenario being tested. Verification of load shedding from the emergency busses will include only those normally powered from the emergency bus during plant operations. The loads described by the term emergency loads are a Residual Heat Removal Pump, a High Pressure Service Water Pump and the 480 Volt emergency bus load center.

The diesel fuel oil quality must be checked to ensure proper operation of the diesel generators. Water content should be minimized because water in the fuel could contribute to excessive damage to the diesel engine. Amendment No. 131 centralized commitments related to Position C.2 of Regulatory Guide 1.137, Revision 1 (October, 1979) "Fuel Oil Systems for Standby Diesel Generators".

Although station batteries will deteriorate with time, utility experience indicates there is almost no possibility of precipitous failure. The type of surveillance described in this specification is that which has been demonstrated over the years to provide an indication of a cell becoming irregular or unserviceable long before it becomes a failure. In addition, the checks described also provide adequate indication that the batteries have the specified ampere hour capability.

The station batteries shall be subjected to a performance test every third refueling outage and a service test during the other refueling outages. This testing frequency complies with the testing requirements of the Institute of Electrical and Electronics Engineers (IEEE) Standard 450 (1975), "Recommended Practice for Maintenance, Testing and Replacement of Large Lead Storage Batteries," and Regulatory Guide 1.129, Revision 1 (February 1978), "Maintenance, Testing and Replacement of Large Lead Storage Batteries for Nuclear Power Plants."

A performance test determines the ability of the battery to meet a specified discharge rate and duration based on the manufacturer's rating. A service test proves the capability of the battery to deliver the design requirements of the dc systems; i.e., supply and maintain in operable status all of the actual emergency loads for the design basis accident. A performance test is the most severe test because the cycling on the battery at manufacturer's rating shortens the service life of the battery. A service test is performed at design load instead of manufacturer's ratings.

The test interval for the Emergency Service Water System, the ESW booster pumps, Emergency Cooling Water pump, Emergency Cooling Tower fans, and pump room fans associated with the ESW pumps is deemed adequate to provide assurance that the equipment will be operable based on good engineering judgement and system redundancy, plus the additional testing accomplished when the diesel generators are tested. Pump operability tests during normal operation will be performed by measuring the shut-off head.

TABLE 3.2.B
INSTRUMENTATION THAT INITIATES OR CONTROLS THE CORE AND
CONTAINMENT COOLING SYSTEMS

Minimum No. of Operable Instrument Channels Per Trip System (1)	Trip Function	Trip Level Setting	Number of Instru- ment Channels Pro- vided by Design	Remarks
2	Core Spray Pump	6 +/- sec.	4 timers	All pumps-loss of offsite power only
	Start Timer	13 sec. +/-7% of setting	2 timers	A&C pumps-offsite power available
		23 sec. +/-7% of setting	2 timers	B&D pumps-offsite power available
1 per 4kV bus (7)	480V Emergency Load Center Timer	3 +/-0.5 sec.	4 timers	All timers - loss of offsite power only
2	LPCI Pump Start Timer (Four Pumps)	2 sec. +/-7% of setting	4 timers	LPCI pumps A&B
		8 sec. +/-7% of setting	4 timers	LPCI pumps C&D
1	ADS Actuation Timer	90 $3/t$ $/=120$ seconds	2 timers	In conjunction with Low Reactor Water Level, High Drywell Pressure and LPCI or Core Spray Pump running interlock, initiates ADS.
2	ADS Bypass Timer	8 $/=t$ $/=10$ minutes	4 timers	In conjunction with low reactor water level, bypass high drywell pressure initiation of ADS.
2	RHR (LPCI) Pump Discharge Pressure Interlock	50 +/- 10 psig	4 channels	Defers ADS actuation pending confirmation of Low Pressure Core Cooling system operation (LPCI Pump running interlock).
2	Core Spray Pump Discharge Pressure Interlock	185 +/- 10 psig	4 channels	Defers ADS actuation pending confirmation of Low Pressure Core cooling system operation (Core Spraying Pump running interlock).

PBAPS

NOTES FOR TABLE 3.2.B

1. Whenever any CSCS subsystem is required by Section 3.5 to be operable, there shall be two operable trip systems. If the first column cannot be met for one of the trip systems, that trip system shall be placed in the tripped condition or the reactor shall be placed in the Cold Shutdown Condition within 24 hours.
2. Close isolation valves in RCIC subsystem.
3. Close isolation valves in HPCI subsystem.
4. Instrument set point corresponds to 378 inches above vessel zero.
5. HPCI has only one trip system for these sensors.
6. With the number of OPERABLE channels less than required by the Minimum OPERABLE Channels per Trip System requirement, place at least one inoperable channel in the tripped condition within one hour or declare the RCIC system inoperable.
7. The failure of a 480V Emergency Load Center timer could result in the failure of a 480V Emergency Load Center to re-energize following the loss of one or both offsite sources. Therefore, Technical Specification 3.9.B.7 will apply when a 480V Emergency Load Center timer is not operable.

PBAPS

LIMITING CONDITIONS FOR OPERATIONSURVEILLANCE REQUIREMENTS3.5.F Minimum Low Pressure Cooling Availability

1. Deleted
2. Any combination of inoperable components in the core and containment cooling systems shall not defeat the capability of the remaining operable components to fulfill the cooling functions.
3. When irradiated fuel is in the reactor vessel and the reactor is in the Cold Shutdown Condition, both core spray systems, the LPCI and containment cooling systems may be inoperable, provided no work is being done which has the potential for draining the reactor vessel.
4. During a refueling outage, fuel and LPRM removal and replacement may be performed provided at least one of the following conditions below is satisfied:
 - a. Both core spray systems and the LPCI system shall be operable except that one core spray system or the LPCI system may be inoperable for a period of thirty days, or
 - b. The reactor vessel head is removed, the cavity is flooded, the spent fuel pool gates are removed, and the water level is maintained at least 21 feet over the top of irradiated fuel assemblies seated in the spent fuel storage pool racks and no work is being performed which has the potential for draining the reactor vessel.

4.5.F Minimum Low Pressure Cooling Availability

1. Deleted